# MIGRATION OF *VANESSA CARDUI* (L.) (LEP.: NYMPHALIDAE) THROUGH CYPRUS, MARCH 2001

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THE STRONG MIGRATORY capability of *Vanessa cardui* is well documented (Larsen, 1988; Dennis, 1993; Ackery *et al.* 1995). Williams (1970, and in Common & Waterhouse, 1981) records a specimen of *V. cardui* captured about 800 km out to sea in the Indian Ocean, further confirming the species' ability to endure long periods of flight. Common & Waterhouse (1981) refer to the possibility of Australian specimens originating in Africa while Larsen (1984) describes *V. cardui* as the most widely distributed of all the world's butterflies.

The accumulation of large numbers of *V. cardui* in Cyprus is not uncommon (C. Makris, pers. comm.), yet there appears to be no previously documented account of mass movement through the island. R. Frost and A. J. Stagg (Royal Air Force Ornithological Society 1996) incidentally reported thousands of *V. cardui* migrating north out to sea from Cape Arnaoutis (VD38 – see Fig. 1.) on 22 and 23 April 1995. R. Parker (1983 and pers. comm.) although noting "thousands" of *V. cardui* appearing on the south coast of Cyprus in September 1974, did not detect any associated migratory activity or note any obvious migrants of this species during a three-season stay on the island in the 1970s. John (2000) observed a change of flight pattern involving very small numbers of *V. cardui* in April 1998 when, overnight, a fast, determined northward flight replaced the usual nectaring behaviour. These were believed to be resident specimens adopting migrant activity rather than fresh immigrants, as local numbers of *V. cardui* fell significantly thereafter.

On 14 March 2001, P. R. Flint (pers. comm.) observed approximately 100 *V. cardui* at the tip of the Karpas Peninsula (XE45) but there was no uniform sign of migratory behaviour so it is possible that these, too, formed part of the resident population. Furthermore, the winter of 2000-2001 in Cyprus was wet (P. R. Flint and D. L. Thomas pers. comm.) encouraging prolific growth of Malva and Carduus and thereby favouring a local build-up of *V. cardui*. Such is the speed and determination of migrating *V. cardui* that detection, even of small numbers, is possible and is unlikely to be confused with the casual flight activity characteristic of a resident population. Indeed, Larsen (1984) refers to the single-minded and atypical behaviour of migratory butterflies that, to an experienced observer, differentiates the specimens from those not partaking in a migration. Not until 18 March 2001 was it beyond doubt that an immigration of substantial numbers of *V. cardui* was taking place over Cyprus.

## Observations

18 March 2001

From 09.30 hours on a clear, sunny day Lyndon Thomas, a resident of Episkopi (VD93), noted the passage of unusually large numbers of *V. cardui* through his garden and those of his neighbours. (This was in sharp contrast to an observation received exactly one week earlier when D. L. Thomas, in one of his regular e-mails detailing his butterfly sightings for the day, wrote of six *V. cardui* in his garden that were ". . . lacking in energy because they allow an approach almost to touching distance before drifting lazily onto the next flower head"). The migrants were flying in noticeable streams, rather than on a broad front, over an area approximately 500 m wide, passing through at a rate of approximately 25 specimens per minute. The area is defined by garden frontage that overlooks a valley facing south-westerly toward Episkopi Bay and the Akrotiri Peninsula (VD92). The migration approached from the south-west and continued north-easterly along the bed of the valley. D. L. Thomas notes the flight as "purposeful, low and fast, only rising to over-fly obstacles in their path, e.g. walls and bushes". Larsen (1984) uses very similar wording in describing the flight behaviour of migrating butterflies: "When they meet a obstacle, such as a house or a wood, they will usually fly over the obstacle rather than round it as a butterfly normally would . . .". Ten specimens were caught by D. L. Thomas which upon release immediately rejoined the stream, again flying with the same determination and speed. The migration continued at this level of intensity until 15.30 hours when the flow eased. By 16.00 hours there were no new arrivals and by dusk at 17.30 hours a "wave" of *cardui* was seen around the house, but with none showing any signs of the earlier, frenetic activity.

19 March 2001

Enlisting the assistance of his wife Pat and two friends early the next morning, D. L. Thomas distributed the group over the same 500 m area and identified six, discrete streams of migrating *V. cardui* again following routes along the valley floor. The party observed the flow between 08.00 and 09.00 hours, each counting *V. cardui* for one minute on four separate occasions within the hour, giving a total of 16 x one minute counts. Between 22 and 25 per minute were counted by each observer. Shortly afterwards the same group of four people encountered very similar *V. cardui* activity at Vouni (VD85) about 18 km inland from the sightings at Episkopi. The local topography dictates that different migrating streams were involved, but numbers counted were similar, with 25-30 per minute over a five-hour period seen heading north through a narrow valley. The counts add up to 7,500-9,000 *V. cardui* observed over the peak time (10.00-13.00 hours), after which numbers declined gradually until by 15.00 hours the count became negligible.

To the far south-west, David Whaley also noted many *V. cardui* passing north through his garden in VD45, 9 km north-east of the south-west tip of the island near Paphos. A friend later commented to him that "huge numbers" crossed near the Paphos coast on the same day heading north.

Toward the east Aristos Aristophanous, an enthusiastic butterfly collector, became aware of the migration as he drove from Alethriko (WD45) to Larnaca Airport (WD56) between 07.40 and 08.00 hours. The migration was described as 'a continuous stream' and at Alethriko was noted to follow an inland course to the north-west, following a valley. At Larnaca the course of flight was westward, a logical course taking into consideration the local topography.

Roger White also encountered "thousands and thousands" of *V. cardui* between Larnaca and Vavatsinia (WD26) with many becoming road casualties.

Further inland, Yiannis Christofides, a local botanist, observed smaller numbers ("tens in a stream") flying north, uphill through the village of Platres in the Troodos Mountains (VD86).

The migration was also recorded on the same day in the north of the country by Peter Flint, another resident and bird recorder for northern Cyprus, who also takes a serious interest in butterflies. Alert to the possibility of a migration after his 14 March sightings of *V. cardui* on the Karpas Peninsula, he and his wife Karen quickly became aware of large numbers flying to the north across a track between Livera (VE91) and Cape Kormakitis (VE91). Two, one-minute counts at 10.40 hours, approximately 1.5 km from the tip of the cape, gave 38 and 34 *V. cardui* over a distance of c. 25 m. Another count 1 km further on produced 75 in one minute. (P. R. Flint observed that occasional *V. cardui* flew back across the track and it is possible that these were resident individuals. D. L. Thomas also made a similar observation in noting that the migrating streams of *V. cardui* at Episkopi flew over representatives of the local population that "continued with their foraging as though nothing was going on"). At the cape *V. cardui* were seen to be flying out to sea on a broad front that stretched away to the west and east from this point. A compass bearing confirmed the direction of flight to be due north. Some flew out at low level but many climbed higher as they flew out over the sea, P. R. Flint records. Low numbers of a few other species were seen to accompany the mass departure (see later). At this point, exactly an hour after the first count was taken, two further one-minute checks gave counts of 40 and 45 respectively, suggesting little change in the numbers of departing migrants. The weather was clear, with Turkey visible; wind direction easterly, Force 1-2. However, by 12.00 hours the wind had quickly freshened to Force 3-4 and the passing rate of migrating butterflies had fallen off sharply. In attempting to quantify the migration P. R. Flint reports: "From the counts we made, a very conservative estimate of the rates of crossing the track would be one individual/metre of track/minute. On a 1500 m length of track this gives 1500 individuals/minute, or 90,000/hour".

20 March 2001

Having witnessed the migration on the previous day, David Whaley and Judy Dawes drove north along the coastline (VD45) above Paphos. At the coast a continuous stream of *V. cardui* were seen flying north toward the tip of the Akamas Peninsula. Later, when on the Akamas ridge at between 400-600 m altitude, *V. cardui* were noted to be flying "generally to the south of west" in the direction of the coast. There is no supporting evidence, but it is possible that upon reaching the coast, the migrating streams followed the coastline north to Cape Arnaoutis. D. Whaley describes the conditions as "fine and clear, temperature around 24°C on the coast, cooler on the ridge. Wind was from the north-west and gusting up to Force 3-4". At 13.30 hours two, one-minute counts of *V. cardui* over a 30 m front on the Akamas ridge gave 67 and 110 specimens respectively, the latter representing the highest count of the passage at any point on the island.

Between 07.30 and 08.00 hours P. R. Flint began three one-minute counts of migrants passing westward through his garden at Kazaphani (WE30) in the north of the island. A maximum count of 75 per minute was recorded at 08.00 hours; other details are given in Table 1. A check nearer the coast (also WE30) gave three counts between 25 and 67 per minute over the next 30 minutes, with all migrants flying west, parallel with the coast, despite being within 200-400 m of the sea. At the coast itself, described as 'a promontory with lowish cliffs' there were far fewer *V. cardui*, ". . . with no obvious concentration there or large scale departure directly towards Turkey". The majority were again observed to be heading west, some even leaving the promontory to fly west over the sea parallel to the coast, while just five were followed through binoculars as they flew out to sea on a west-north-west heading. Once again, by lunchtime the migration had fallen away significantly.

21 March 2001

By this date, numbers of migrants were lower and reports were only received from P. R. Flint. Garden counts between 07.00 and 08.00 hours gave numbers ranging from two to 12 per minute. Direction of flight was westerly. A visit later that morning to the Karpas Peninsula in the east, produced higher counts at Galateia Lake (WE91). Here, migrant *V. cardui* were counted at 24 per minute (10.55 hours) and 32 per minute (11.15 hours) crossing the lake toward the west and at 11.20 hours, 45 per minute were counted as a stream of *V. cardui* followed a road verge south-westerly along the edge of the lake.

25 & 26 March 2001

Numbers of *V. cardui* fell further over succeeding days but migrant activity was still evident. P. R. Flint recorded 12 per minute in one count in his garden on 25 March and nine per minute in another count on 26 March.

### Mixed migrations

*V. cardui* normally migrates alone but has been recorded in association with a migration of *Danaus chrysippus* (Linnaeus, 1758) (Meinertzhagen in Larsen & Nakamura 1983). A. J. Stagg (Royal Air Force Ornithological Society, 1996) observed *Vanessa atalanta* (Linnaeus, 1758) migrating northwards from Cape Arnaoutis on three separate occasions on 22 March 1995, along with thousands of *V. cardui*. In the migrations through Cyprus in 2001, very small numbers of *Pieris brassicae* (Linnaeus, 1758), *Colias crocea* (Geoffroy, 1785) and *Vanessa atalanta* were observed by P. R. Flint (pers. comm.) being drawn along with hundreds of thousands of *cardui* as they left the north coast of Cyprus on 19 March. It is conceivable that this was an 'involuntary' emigration by these other species although they, too, are recognised migrants.

## Discussion

### Behaviour of *Vanessa cardui* within Cyprus

Immigrant *V. cardui* arrived in waves, with numbers on at least three of the four days of the migration falling dramatically in the afternoon (see Table 1. L. Thomas 18 &19 March and P.. Flint 19 & 20 March). The precise timing of the first arrival of these waves has not been established, but reports of a migration in full progress in the early morning (before 08.00 hours) were received from observers based on the south coast, and P. R. Flint (see Table) observed them close to the north coast (WE30) at 07.00 hours. Although none was seen flying in over the sea, the close proximity of the sightings to the coast at Episkopi and Larnaca, the timing of sightings, the nature of the flight and the huge numbers involved, favour the arrival of a new, daily wave and rules out the possibility of stragglers remaining from the previous day's migration. There can be no doubt that each successive wave arrived in Cyprus after a night crossing, quite possibly passing over the south coast before dawn, and continuing until around midday or early afternoon.

Upon arrival at the south coast, the direction of flight seems in at least some cases to have been influenced by topographical features, as migrants were seen to follow valley courses or tracks. For example, at Episkopi, L. Thomas observed *V. cardui* following a north-easterly course inland whereas A. Aristophanous saw them take a north-westerly course near Alethriko but, 10 km further to the east, a more westerly direction was being followed (see Fig. 1). The common factor in these apparently haphazard bearings is that flight paths generally follow the course of rivers or valleys inland in the direction of the Troodos Mountains, as a glance at a relief map of the island will immediately indicate. Rivers in Cyprus, even in March, have little if any water, but residual moisture would certainly encourage vegetative growth. However, as ovipositing was only noted near the north coast (P. R. Flint, pers. comm.), it may simply be that the migrants veered slightly away from a north

Table 1. Summary of *Vanessa cardui* sightings, March 2001

| Date | Time | Observer | Location | Map reference | Direction of flight | Est. numbers per min over 23-30m front | Weather conditions | Wind direction |
|---|---|---|---|---|---|---|---|---|
| 18 March | 09.30 to 15.30 | Lyndon Thomas | Episkopi | VD93 | NE following valley | c.25/min over the peak period of activity | "Clear, sunny 24-26°C 5-10% humidity" | "Light westerly" |
| 19 March | 08.00 to 09.00 | Lyndon Thomas +3 | Episkopi[1] | VD93 | NE following valley | 22-25 (counts by four people over 4 x 1 minute periods) | Not stated | Not stated |
| | 10.00 to 15.00 | Lyndon Thomas | Vouni, c.800 m alt. | VD85 | N following valley | 25-30 up to 13.00, stream weakened by 14.00 then negligible by 15.00 | Not stated | Not stated |
| 19 March | N/S | David Whaley | Paphos area at 350 m alt. | VD45 | N through garden | "Many" | Not stated | Not stated |
| 19 March | 07.40 | Aristos Aristophanous | Alethriko to | WD45 | NW following Valley | "Continuous stream" | Not stated | Not stated |
| | 08.00 | | Larnaca | WD56 | W | "Continuous stream" | | |
| 19 March | N/S | Roger White | Throughout route from Larnaca to Vavatsinia | WD56-WD26 | N mainly | "Thousands and thousands" | Not stated | Not stated |
| 19 March | N/S | Yiannis Christofides | Platres, 1000 m alt. | VD86 | N uphill through village | "Tens in a stream" | Not stated | Not stated |
| 19 March | 10.40 | Peter Flint | Livera to Cape Kormakitis | VE91 | N out to sea | 38 | "Clear, sunny" | "Light easterly, Force 1-2" |
| | 10.45 | | | | | 34 | | |
| | 10.55 | | | | | 75 | | |
| | 11.40 | | Cape Kormakitis | VE91 | N out to sea | 40 | | |
| | 11.42 | | | | | 45 | | |
| | 12.00 | | | | | "Fallen off sharply" | | "Force 3-4" |
| | 12.15 | | | | | 3 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 20 March | 09.15 | David Whaley | Paphos coastal area | VD45 | N along coast | "Continuous stream" | "Fine, clear, 24°C at coast" | "From NW, gusty to Force 3-4" |
| | 13.30 | | Akamas Peninsula, 400 m | VD47 | SW to coast | 67 | | |
| | 13.31 | | – 600 m alt. | | | 110 | | |
| 20 March | 07.30 | Peter Flint | Kazaphani, 90 m alt. | WE30 | W through garden | 29 | "Warm, calm, clear" | "Calm" |
| | 07.40 | | | | | 33 | | |
| | 08.00 | | | | | 75 | | |
| | 08.25 | | c.400 m from north coast | WE30 | W along coastal plain | 30 | | |
| | 08.30 | | c.200 m from north coast | WE30 | W along coastal plain | 25 | | |
| | 09.05 | | Karakoumi | WE30 | W along coastal plain | 67 | | |
| | 09.20 | | Kazaphani, 90 m alt. | WE30 | W | 49 | | |
| | 09.30 | | | | | 35 | | |
| | 09.40 | | | | | 39 | | |
| | 12.30 | | | | | 6 | | |
| | 13.30 | | | | | 3 | | |
| 21 March | 07.05 | Peter Flint | Kazaphani, 90 m alt. | WE30 | W | 5 | Not stated | Not stated |
| | 07.15 | | | | | 2 | | |
| | 07.30 | | | | | 10 | | |
| | 08.00 | | | | | 12 | | |
| | 10.55 | | Galateia Lake | WE91 | W across lake | 24 | Not stated | "Westerly, Force 2-3" |
| | 11.15 | | | | | 32 | | |
| | 11.20 | | | | SW along road verge | 45 | | |
| 25 March | 10.40 | Peter Flint | Kazaphani[2], 90 m alt. | | W | 12 | Not stated | Not stated |
| 26 March | 12.30 | Peter Flint | Kazaphani, 90m alt. | | W | 9 | Not stated | Not stated |

Notes:
1. The migration at Episkopi was noted as six separate "streams" of *V. cardui* following the course of a wide valley.
2. Small numbers were noted throughout the day. 12 per minute represents the highest score.

or north-westerly course as a temporary, easy option. Nectaring was only noted in the late afternoon after the main wave of migrants had passed through the island. There appears to be no other pattern e.g. a fixed angle to the sun or wind factor to influence the selected flight path.

The presence of *V. cardui* over much of the island indicates a very large scale migration involving many millions of individuals. The migration appears to have approached and crossed Cyprus generally from the south or south-east on an island-wide front (perhaps even wider), with records spanning a distance of 200 km from the Karpas Peninsula ("panhandle") in the north-east to the Akamas Peninsula in the west. There is an indication that those reaching the north of the island from the direction of Larnaca Bay and Famagusta Bay unexpectedly then followed the northern coastal plain to its most westerly point at Cape Kormakitis. Here, the migrants left on a northerly course in the direction of Turkey, some 70 km distant. All P. R. Flint's observations from the north of Cyprus, other than those described at Cape Kormakitis on 19 March, consistently show movement in a westerly direction. It is possible, though unconfirmed, that similar behaviour took place on the northern tip of the Akamas Peninsula with migrants following the coastline north and west to depart at Cape Arnaoutis (see Fig.1). This could possibly be a strategy that enables migrants flying on a broad front to "re-group", i.e. to concentrate numbers before embarking on the next stage of a migration. This behaviour appears to be unusual for *V. cardui*, which is associated with straight, unswerving flight throughout its migration (T. B. Larsen, pers. comm.). Certainly the migration across Cyprus conformed in other respects e.g. *V. cardui* was observed flying over, rather than round, obstacles such as walls, bushes, houses and even people. D. L. Thomas, (pers. comm.) placed himself directly in line with one stream of migrating *V. cardui* and found that they flew over him without deviating to either side, after which they immediately returned to their chosen low flight level.

**Estimated numbers**

Numerous (approximately 50) one-minute counts of migrating *V. cardui* were made by observers in Cyprus. Although varying numbers were counted, at peak times an average of 50 migrants per minute per 25 metre zone, passed through. This extrapolates to 120,000 per hour per 1000 metres. Calculating the size of the migrating front over the 200 km is not without risk, but assuming a concentration of migrants along departure points totalling, say, 10% (20 km) of the migrating front, as well as a four day passage occupying around five hours peak departure per day, then an estimated 48 million *V. cardui* were involved in the migration. Even larger numbers may be involved in migrations, as quoted by Larsen (1984) who cites as an example an estimated three billion *V. cardui* engaged in a northerly spring migration in southern California and neighbouring states. In all probability the numbers

estimated in the migration through Cyprus are conservative and may even be seriously under-estimated. Indeed, the migratory front itself could have been far more extensive.

**Origin, Direction and Destination of migration**

It is known that huge numbers of *V. cardui* may breed in desert areas in suitable years and that large migrations may occur after high rainfall. Larsen (1984) states that ". . . in rainy years huge numbers breed in the Arabian desert zone". In the same book T. B. Larsen has a reference to ". . . countless numbers of Painted Lady larvae near Medain Salih in the Hejaz", on the western coast of the Red Sea (G. Popov, 1947 in Larsen 1984). A delightful account of an observation by S. B. J. Skertchly, quoted by C. B. Williams in *The Migration of Butterflies*, but reproduced here from Barrett & Burns (1966), beautifully describes a scene in the Sudan: "From my camel I noticed that the whole mass of the grass seemed violently agitated, although there was no wind. On dismounting I found that the motion was caused by the contortions of pupae of *P. cardui*, which were so numerous that almost every blade of grass seemed to bear one. Presently the pupae commenced to burst. Myriads of butterflies sprinkled the ground, and when the sun shone, dried their limp wings. About half an hour after the birth of the first, the whole swarm rose as a dense cloud and flew eastward towards the sea".

Dennis (1993), in writing about the evolution of the migratory habit, refers to the influence of weather systems on the extent of the irruption, frequency and disparity of distances covered in different years. In discussion with Torben Larsen two candidate areas, the Nile Delta and north-western Saudi Arabia, emerged as possible sources of the migration through Cyprus. Accordingly, with the assistance of R. J. Bitzer of Iowa State University an attempt was made, using satellite images, to locate likely areas in the Middle East where heavy winter precipitation could have favoured the growth of larval host-plants, potentially leading to a build-up of a large population of *V. cardui*. Weather conditions in the north-western area of Saudi Arabia early in 2001 appeared favourable, though no evidence of mass movement of *V. cardui* has subsequently been reported from these regions.

While Saudi Arabia cannot be eliminated as the source of a possible complementary migration, it now appears that the Negev region of Israel (see Fig. 2.) gave rise to the population explosion leading to the influx of migrants across Cyprus. Benyamini (2001a and in pers. comm.) describes the rainfall in the south of the country as about 80% of average but falling steadily throughout the winter, thereby encouraging prolific growth of larval host-plants. These ideal conditions prevailed in the central and northern Negev and also in the Jordan Valley. D. Benyamini (pers. comm.) writes that he first noted singletons of migrating *V. cardui* arriving from the south and south-east in November 2000, a month after the first rainfall. These, he believes, were the "seeds" of the first generation which emerged in January and, finding

conditions highly opportune, liberally oviposited on the abundant vegetation. Exponential growth of the population was further helped by the absence of large numbers of predators and parasites so early in the season. In the first 12 days of March, D. Benyamini further states ". . . we had records of single migrants from the Negev to Galilee, mostly migrating northwards or north-westwards. However, from 12-20 March a daily, continuous migration was seen moving westerly from Beer-Sheva in the Negev across the central plateau (Jerusalem), in the coastal plain near Tel Aviv and in Western Galilee, along a front of approximately 200 km".

The change of flight to one of a westerly direction parallels some of the observations by P. R. Flint and D. Whaley referred to earlier, in Cyprus. However, there are no reports from Israel to indicate whether, upon reaching the coast, the migrating *V. cardui* followed a northerly course along the coastal plain or quickly left the mainland on a broad front. Independently D. Benyamini and I have estimated the extent of the front to be in the region of 200 km so it seems likely that there was little deviation until the mass, perhaps on moving out to sea, changed to a north-westerly course. Nectaring was evident along the coastal plain prior to their departure from Israel. Benyamini (2001b and in pers. comm.) refers to the exceptional growth of the wild *Chrysanthemum coronarium* which carpeted the coastal areas and provided ". . . a perfect re-fuelling station during the peak of the migration period". He further comments that the arrival of the migrants near the coast synchronized well with the optimum period for nectar-plant quality, and adds that this is an annual occurrence in the south-east Mediterranean where ". . . local conditions combine to permit the rapid growth of 'clean' host-plants and later endless carpets of flowers that are ready to 'refuel' the migrants before they start to cross the Eastern Mediterranean northwards and north-westwards to Cyprus, Turkey and Europe."

Migrants were recorded arriving at the south coast of Cyprus from 08.00 hours (but may have begun arriving much earlier) indicating that at least part of the passage took place in the hours of darkness. T. B. Larsen (pers. comm.) has "clocked" migrating *V. cardui* flying at a speed of about 30 km per hour so the journey of approximately 340 km from the coast of Israel could have been accomplished in 12 hours or less. Yet observations of *V. cardui* behaviour in Cyprus, and probably Israel too, show that migratory activity ceases in mid-to-late afternoon, when the principal emphasis turns to nectaring. Nevertheless, the timing points either to an unlikely evening departure from Israel or a much slower journey commencing, perhaps, 18-20 hours before the arrival time in Cyprus. Crossing to the island's northern coast would have been achieved in about three hours, after which the migrants departed in the direction of Turkey.

Their arrival on the Turkish coast was confirmed by Marco Witte, one of a group of 13 Dutch birdwatchers, who observed *V. cardui* approach the coastline from a southerly direction over the sea at the Goksu Delta on 21

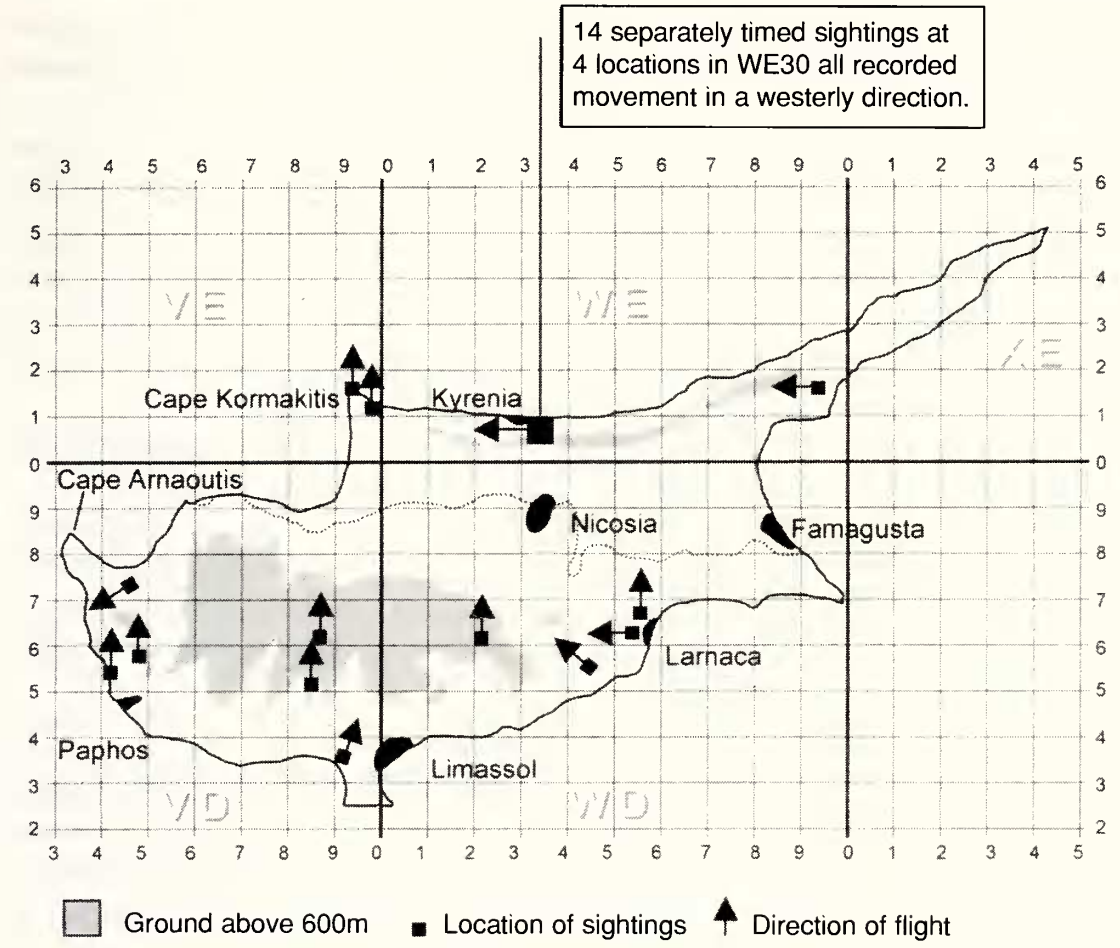


**Figure 1.** *Vanessa cardui:* migratory routes and direction of flight.

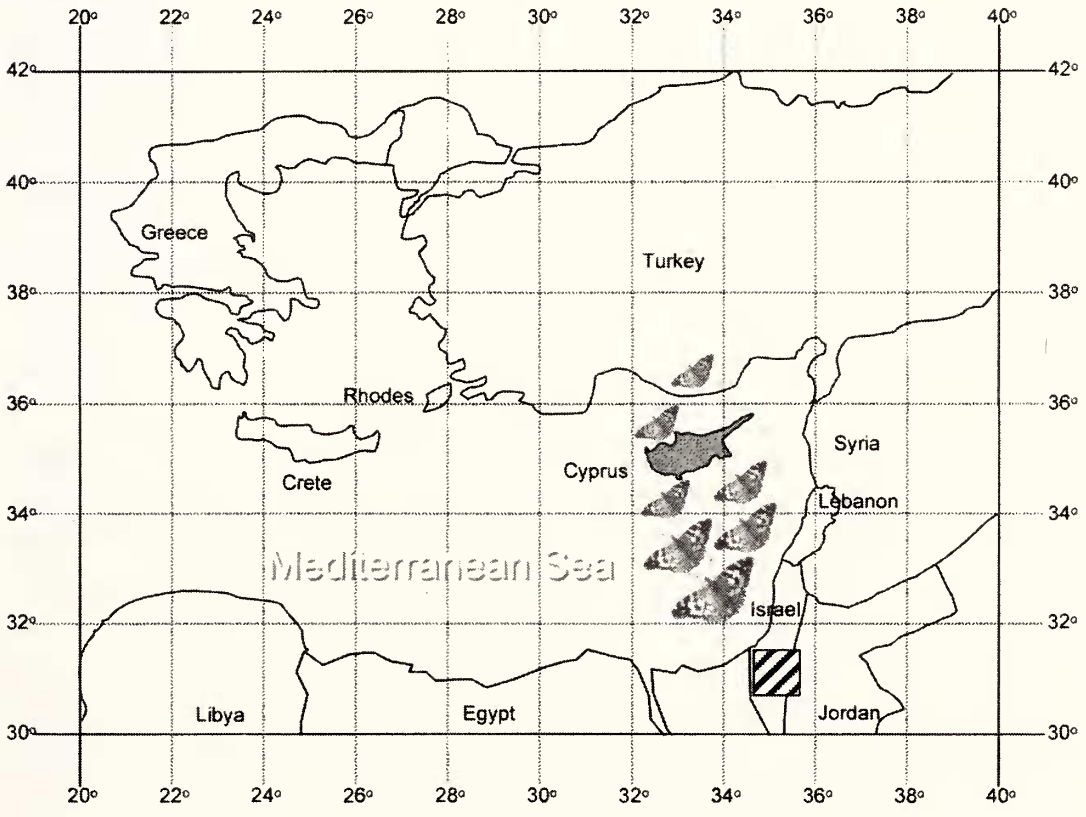


**Figure 2.** Probable source and direction of migratory path.

March 2001. Numbers were not counted but he writes: "you could see them everywhere". Unfortunately, no further details are known and no other reports have been received of the arrival of the migration in Turkey. Eastern and northern Turkey were still in the grip of winter at the time so a limited, westerly dispersal along the south coast of the country is a reasonable prediction. The migration might have extended westward as far as Rhodes where, early in May 2001, R. Parker (pers. comm.) observed large numbers of very worn *V. cardui* nectaring near the coast. Further west, no reports of migrant activity were noted in Greece during March or early April (J. G. Coutsis pers. comm.).

Migrations of *V. cardui* are normal annual occurrences in the south-east Mediterranean and will be summarised along with other migrations in a forthcoming paper (D. Benyamini *in press*) but it is less common for such large numbers to cross through Cyprus (pers.obs. R. Parker, E. John). Whether or not this spectacular migration will have any subsequent influence on the number of migrants to arrive in the UK and northern Europe in 2001, remains to be seen.

## Postscript

A second, smaller migration of *V. cardui* was observed passing over Cyprus between 28 and 30 April 2001. Simultaneously, a migration of *Pieris rapae* (Linnaeus, 1758) was seen by another birder, Alison McArthur, who wrote: "In order to be sure that they (*V. cardui*) were migrants coming in from the sea I went down to the headland just after 1200 hours. To my surprise I only saw two Painted Ladies but instead saw several thousand Small Whites apparently drifting in off the sea from the south/south-east, many following the coastline". A. McArthur continues: "Unbeknownst to me, back at the flat, my husband was witnessing a 'snowfall' of white butterflies. He did three counts of one minute over a five metre front and came up with figures of 39, 13 and 22. This intense movement lasted for roughly an hour and ended just before the wind strengthened considerably from the south/south-east". J. G. Coutsis (pers. comm.) also advised of "a mass movement of rather fresh *cardui*" in Athens, between 29 April and 2 May 2001.

## Acknowledgements

I am particularly grateful to Peter Flint and Lyndon Thomas for being the first to recognize and report the presence of a migration and for enthusiastically maintaining detailed records of its progress through the island. My thanks also go to Aristos Aristophanous, Yiannis Christofides, Alison McArthur, Christodoulos Makris, Michael Piponides, David Whaley, Roger White and Marco Witte for additional records or other assistance. Tracing the source of the migration would not have been possible without the willing assistance of Dubi Benyamini and Torben Larsen, both of whom gave valuable and much appreciated, information. I am also indebted to Royce Bitzer, John Coutsis and Rob Parker for their contributions to the paper.

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## Thistle Ermine *Myelois circumvoluta* (Geoff.) (Pyralidae), Blackneck *Lygephila pastinum* (Tr.) (Noctuidae) and Convolvulus Hawk-moth *Agrius convolvuli* (L.) (Sphingidae): three interesting Staffordshire moths (Lepidoptera)

Three moths encountered in Staffordshire during the course of the last two years appear to be particularly noteworthy and worth placing on permanent record.

On 28 September 2000, Mr Paul Evans found a large dead moth on the roadside in Stafford town centre and brought it to me for identification. It was immediately recognised as a Convolvulus Hawk-moth *Agrius convolvuli.* After showing it to Keith Bloor, Keeper of Natural History at The Potteries Museum, Hanley, I placed it in my own collection. From June to October 2000, there was migrant moth activity in the county, with Humming-bird Hawk-moth *Macroglossum stellatarum* (L.) and Pearly Underwing *Peridroma saucia* (Hb.) both recorded. I captured a single specimen of ab. *margaritosa* Haw. of the last species at sugar in my garden on 26 October; several others were all of the typical form. Rush Veneer *Nomophila noctuella* (D.& S.), Red Admiral *Vanessa atalanta* (L.) and Painted Lady *V. cardui* (L.) appeared in moderate numbers whilst there were lesser quantities of Clouded Yellow *Colias croceus* Geoffr. scattered about the county and a Vestal *Rhodometra sacraria* (L.) was also reported.